Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently amended) A process for the production of an anhydrosugar alcohol, without using organic solvents, the process comprising:

heating a pentite or hexite sugar alcohol or monoanhydrosugar alcohol starting material, with stirring and without solvents, until molten;

dehydrating the starting material, under vacuum and while maintaining heat and stirring, in the presence of a solid acid catalyst and in the absence of solvents to produce a dehydrated anhydrosugar alcohol mixture; and

purifying the anhydrosugar alcohol without solvents.

Claims 2-3 (Cancelled).

4. (Previously amended) The process of claim 1, wherein the solid acid catalyst is an acidic zeolite powder.

5. (Previously amended) The process of claim 4, wherein the acidic zeolite powder is selected from the group consisting of CBV 3024, 5534G, T-2665, and T-4480.

6. (Previously amended) The process of claim 1, wherein the solid acid catalyst is an acidic ion exchange resin.

7. (Original) The process of claim 6, wherein the acidic ion exchange resin is selected from the group consisting of AG50W-X12, Amberlyst 35, Amberlyst 15, RCP21H, and Dowex 50Wx4.

8. (Original) The process of claim 6 wherein the acidic ion exchange resin is added in an amount giving from about 0.01 to about 0.15 gram equivalents of resin to sugar alcohol.

9. (Original) The process of claim 1 wherein the purification comprises vacuum distillation of the dehydrated anhydrosugar alcohol mixture followed by melt crystallization.

10. (Original) The process of claim 1 wherein the purification comprises vacuum distillation of the dehydrated anhydrosugar alcohol mixture followed by a re-distillation.

11. (Original) The process of claim 1, further comprising a final separation of the dehydrated anhydrosugar alcohol by centrifugation.

12. (Original) The process of claim 1, further comprising a final separation of the dehydrated anhydrosugar alcohol by filtration.

13. (Currently amended) A process for the production of an anhydrosugar alcohol, without using organic solvents, the process comprising:

heating a pentite or hexite sugar alcohol or monoanhydrosugar alcohol starting material, with stirring and without solvents, until molten;

dehydrating the starting material, under vacuum and while maintaining heat and stirring, in the presence of an acid catalyst and in the absence of solvents to produce a dehydrated anhydrosugar alcohol mixture, wherein the acid catalyst is selected from the group consisting of sulfuric acid, phosphoric acid, p-toluenesulfonic acid, p-methanesulfonic acid, and solid acid catalysts;

vacuum distilling the dehydrated anhydrosugar alcohol mixture to produce an anhydrosugar alcohol distillate;

melt crystallizing the anhydrosugar alcohol distillate to produce a crystallized anhydrosugar alcohol product; and

centrifuging the crystallized anhydrosugar alcohol product to produce an anhydrosugar alcohol.

Claims 14-16 (Cancelled).

17. (Previously amended) The process of claim 16 wherein the acidic zeolite powder is selected from the group consisting of CBV 3024, CBV 5534G, T-2665, and T-4480.

18. (Cancelled).

19. (Previously amended) The process of claim 18 wherein the acidic ion exchange resin is selected from the group consisting of AG50W-X12, Amberlyst 15, Amberlyst 35, RCP21H, and Dowex 50Wx4.

20. (Original) The process of claim 13 wherein the dehydration is performed at a temperature of from about 98°C to about 191°C.

21. (Original) The process of claim 13 wherein the dehydration is performed at a temperature of from about 98°C to about 130°C.

22. (Original) The process of claim 13 wherein the dehydration is performed at a temperature of from about 98°C to about 120°C.

23. (Original) The process of claim 13 wherein the dehydration is performed at a vacuum pressure of from about .01 Torr to about 40 Torr.

24. (Original) The process of claim 13 wherein the dehydration is performed at a vacuum pressure of from about .01 Torr to about 10 Torr.

25. (Original) The process of claim 13 wherein the dehydration is performed at a vacuum pressure of from about 1 Torr to about 10 Torr.

26. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vapor temperature of from about 155°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

27. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vapor temperature of from about 160°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

28. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vapor temperature of from about 165°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

29. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vapor temperature of 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

30. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vacuum pressure of from about .01 Torr to about 40 Torr.

31. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vacuum pressure of from about 0.1 Torr to about 10 Torr.

32. (Original) The process of claim 13 wherein the vacuum distillation is performed at a vacuum pressure of from about 1 Torr to about 10 Torr.

33. (Currently amended) A process for the production of purified isosorbide, without the use of organic solvents, the process comprising:

heating sorbitol powder at a temperature of from about 98°C to about 105°C, with stirring and without solvents, until molten;

dehydrating the melted sorbitol by catalysis with an acidic ion exchange resin, added in an amount giving from about 0.01 to about .15 equivalents, in the absence of solvents, under vacuum pressure of from about 1 Torr to about 10 Torr, and while maintaining stirring and a temperature of from about 98°C to about 191°C, to form an isosorbide mixture;

vacuum distilling the dehydrated isosorbide at a pot temperature of approximately 180°C and a vapor temperature of approximately 170°C, and a vacuum pressure of from about 1 Torr to about 10 Torr, to form an isosorbide distillate;

melt crystallizing the isosorbide distillate by heating the distillate to at least approximately 65°C and then cooling the distillate, over from about 30 minutes to about 45 minutes, to a temperature of about 25°C to about 35°C to form an isosorbide solution having a slurry-like consistency;

centrifuging the isosorbide solution and;

collecting the purified isosorbide.

34. (Currently amended) The process of claim 1 wherein the pentite or hexite sugar alcohol or ~~monoanyhdrosugar~~ monoanhydrosugar alcohol starting material is selected from the group consisting of arabinitol, ribitol, sorbitol, mannitol, galactitol, iditol, and mixtures thereof.

35. (Currently amended) The process of claim 34 wherein the pentite or hexite sugar alcohol or ~~monoanyhdrosugar~~ monoanhydrosugar alcohol starting material is sorbitol.

36. (Previously added) The process of claim 1 wherein said anhydrosugar alcohol is a dianhydrohexitol.

37. (Previously added) The process of claim 36 wherein the dianhydrohexitol is isosorbide.

38. (Previously added) The process of claim 1 wherein the dehydration is performed at a temperature of from about 98°C to about 191°C.

39. (Previously added) The process of claim 1 wherein the dehydration is performed at a temperature of from about 98°C to about 130°C.

40. (Previously added) The process of claim 1 wherein the dehydration is performed at a temperature of from about 98°C to about 120°C.

41. (Previously added) The process of claim 1 wherein the dehydration is performed at a vacuum pressure of from about .01 Torr to about 40 Torr.

42. (Previously added) The process of claim 1 wherein the dehydration is performed at a vacuum pressure of from about .01 Torr to about 10 Torr.

43. (Previously added) The process of claim 1 wherein the dehydration is performed at a vacuum pressure of from about 1 Torr to about 10 Torr.

44. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vapor temperature of from about 155°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

45. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vapor temperature of from about 155°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

46. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vapor temperature of from about 160°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

47. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vapor temperature of from about 160°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

48. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vapor temperature of from about 165°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

49. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vapor temperature of from about 165°C to about 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

50. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vapor temperature of 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

51. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vapor temperature of 170°C and a pot temperature of at least the distilling point of the dehydrated anhydrosugar alcohol.

52. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vacuum pressure of from about .01 Torr to about 40 Torr.

53. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vacuum pressure of from about .01 Torr to about 40 Torr.

54. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vacuum pressure of from about 0.1 Torr to about 10 Torr.

55. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vacuum pressure of from about 0.1 Torr to about 10 Torr.

56. (Previously added) The process of claim 9 wherein the vacuum distillation is performed at a vacuum pressure of from about 1 Torr to about 10 Torr.

57. (Previously added) The process of claim 10 wherein the vacuum distillation is performed at a vacuum pressure of from about 1 Torr to about 10 Torr.

58. (Previously added) The process of claim 13 wherein the acid catalyst is a solid acid catalyst.

59. (Currently amended) The process of claim 13 wherein the pentite or hexite sugar alcohol or ~~monoanyhdrosugar~~ monoanhydrosugar alcohol starting material is selected from the group consisting of arabinitol, ribitol, sorbitol, mannitol, galactitol, iditol, and mixtures thereof.

60. (Currently amended) The process of claim 59 wherein the pentite or hexite sugar alcohol or ~~monoanyhdrosugar~~ monoanhydrosugar alcohol starting material is sorbitol.

61. (Previously added) The process of claim 13 wherein said anhydrosugar alcohol is a dianhydrohexitol.

62. (Previously added) The process of claim 61 wherein the dianhydrohexitol is isosorbide.

63. (New) The process of claim 58 wherein the solid acid catalyst is an acidic zeolite powder.

64. (New) The process of claim 58 wherein the solid acid catalyst is an acidic ion exchange resin.